

CLAIMS

What is claimed is:

1. A ceramic composite having high temperature stability, comprising:
5 a first ceramic material selected from the group consisting of monazites and xenotimes and having a stoichiometric ratio between a metal of the first ceramic material and a phosphate of the first ceramic material of about 1:1;
a second ceramic material combined with said first ceramic material to form the ceramic composite; and
10 one of said first and second ceramic materials forming a ceramic matrix with the other of said ceramic materials embedded in said ceramic matrix;
2. The ceramic composite of Claim 1 wherein the metal of the first ceramic material is selected from the group consisting of lanthanum, cerium,
15 yttrium, and combinations thereof.
3. The ceramic composite of Claim 1 wherein the coating composition further comprises an inert powder.
- 20 4. The ceramic composite of Claim 3 wherein the inert powder is Al_2O_3 , zirconia, YAG, mullite, or compositions thereof.
5. The ceramic composite of Claim 1 wherein the coating composition further comprises SiC additives.
25
6. The blanket according to Claim 1, wherein the monazite or xenotime is synthesized by forming a precipitate from an aqueous solution comprising a lanthanide salt and a phosphate, washing the precipitate with water, and washing the precipitate with an organic base with a pH of greater than about 12.
30
7. The blanket according to Claim 6, wherein the organic base is tetramethylammonium hydroxide.

8. An insulating blanket having high temperature stability, comprising:
a ceramic fabric including ceramic fibers; and
a coating on the fibers of a first ceramic material selected from the group
consisting of monazites and xenotimes and having a stoichiometric ratio between
5 a metal of the first ceramic material and a phosphate of the first ceramic material
of about 1:1.

9. The blanket according to Claim 8, wherein the monazite or xenotime
is synthesized by forming a precipitate from an aqueous solution comprising a
10 lanthanide salt and a phosphate, washing the precipitate with water, and washing
the precipitate with an organic base with a pH of greater than about 12.

10. The blanket according to Claim 9, wherein the organic base is
tetramethylammonium hydroxide.

15

11. The blanket according to Claim 8, wherein the coating further
comprises a SIC additive.

12. The blanket according to Claim 8, wherein the coating further
20 comprises an inert powder.

13. The blanket according to Claim 8, wherein the inert powder is Al_2O_3 ,
zirconia, YAG, mullite, or compositions thereof.

25 14. The blanket according to Claim 8, wherein the metal further
comprises lanthanum, cerium, yttrium, or combinations thereof.

15. A mobile platform comprising:
a body having an area to be exposed to temperatures of at least about 2000 degrees Fahrenheit; and

an insulating blanket covering the area and having

a ceramic fabric including ceramic fibers; and

a coating on the fibers of a first ceramic material selected from the group consisting of monazites and xenotimes and having a stoichiometric ratio between a metal of the first ceramic material and a phosphate of the first ceramic material of about 1:1.

16. The mobile platform according to Claim 15, further comprising a re-entry vehicle.

17. The mobile platform according to Claim 15, wherein the monazite or xenotime is synthesized by forming a precipitate from an aqueous solution comprising a lanthanide salt and a phosphate, washing the precipitate with water, and washing the precipitate with an organic base with a pH of greater than about 12.

18. The mobile platform according to Claim 17, wherein the organic base is tetramethylammonium hydroxide.

19. The mobile platform according to Claim 15, wherein the coating further comprises a SIC additive.

20. The mobile platform according to Claim 15, wherein the coating further comprises an inert powder.

21. The mobile platform according to Claim 15, wherein the inert powder is Al_2O_3 , zirconia, YAG, mullite, or compositions thereof.

22. The mobile platform according to Claim 15, wherein the metal further comprises lanthanum, cerium, yttrium, or combinations thereof.